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(54) **Duplex holographic film**

(57) The present invention relates to an holographic structure comprising an organic solvent based embossed layer, a metallic layer located onto the embossed layer, and an organic solvent based printing ink layer characterised in that the printing ink layer and the metallic layer are solely separated by a water solvent based primer.

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## Descripti n

### Technical field

[0001] The invention relates to a film structure for a holographic film.

### Background of the invention

[0002] Holographic films are used more and more widely, particularly in the packaging of consumer goods. In an holographic structure, an embossed layer is covered with a metallic layer. This has the advantage of providing a three dimensional structure effect which is catching to the eye. However, this often requires redesign of the whole film structure, particularly due to the fact that the metallic layer is not a thermo-plastic layer but a thin metallic layer.

[0003] The present invention concerns an holographic structure comprising an organic solvent based embossed layer, a metallic layer located onto the embossed layer, and an organic solvent based printing ink layer.

[0004] Among the advantages of such a structure is the eye-catching effect which can be obtained by the combination of holographic techniques and the holographic techniques.

[0005] While having this and other advantages, such structures, particularly when integrated into laminated film structures, have disadvantages. For example, a typical film structure will comprise the organic solvent based lacquer printed or applied, prior to embossment, onto a first side of a polyester (PET) film, typically a 12µm thick film. Once this lacquer is applied to this PET film, it is embossed so as to produce the holographic pattern. Once embossed, a metallic layer, typically aluminium, is vaporised or applied in another manner onto the embossed lacquer to form the "holographic core". The PET side which is not covered by the embossed lacquer can be thereafter laminated to other films, for example a 180 µm thick PE polyethylene film. Once this is done, printing can occur. However, it was found that direct printing onto the metallic layer was leading to dissolution of the embossed layer by penetration of the ink solvents through the thin metallic layer.

[0006] However, all these film structure are showing dissolution of the embossed lacquer due to ink solvent going through the metallic layer.

[0007] The invention seeks to provide an holographic structure of the above mentioned kind which does not lead to dissolution of the embossed lacquer.

### Summary of the invention

[0008] In accordance with the invention, this object is accomplished in a holographic structure of the above mentioned kind in that the printing ink layer and the metallic layer are solely separated by a water solvent

based primer.

[0009] A process in accordance with the invention has a number of advantages. Since the metallic layer and the printing ink layer are separated by the water solvent based primer, migration of the organic solvent from the ink layer to through the water solvent based primer is prevented, as the organic solvent was found not to migrate through a water solvent layer. Therefore, dissolution of the embossed lacquer by migration of the organic solvent present in the ink layer is avoided.

### Detailed description of the invention

[0010] The invention relates to an holographic structure. By an holographic structure, it should be understood that the structure is exhibiting a three dimensional eye-catching impression based on the metallisation of an embossed layer. Indeed, according the holographic structure comprises an organic solvent based embossed layer. By organic solvent based, it should be understood that the layer is applied together with a solvent, for example by a printing technique, the solvent being organic. The layer is embossed by processes already known by the man skilled in the art of making holograms. Typically, embossement is obtained by application of a pressure onto the layer, so as to produce the pattern which will exhibit the holographic effect. This holographic effect is produced in combination with the metallic layer located onto the embossed layer. Typically, this metallic layer is an aluminium layer, which is applied by vaporisation, thereby giving a thickness of a few atomic layers. Further, the holographic structure comprises an organic solvent based printing ink layer. This layer may comprise one or more inks having various colours, these being typically applied by the usual printing techniques together with a solvent, which is an organic solvent in the structure of the invention. It should be mentioned that an organic solvent should be understood as being non aqueous. Additionally, the printing ink layer and the metallic layer are solely separated by a water solvent based primer. By solely, separated, it should be understood that no laminated layers are to be found between the printing ink layer and the metallic layer. It is necessary that the primer is water-based so as to prevent migration of the solvent from the inks into the embossed layer through pin-holes which usually are present in the thin metallic layer. Indeed, migration of organic solvents through the metallic layer was found to dissolve the embossed layer. It should be understood that the primer could comprise several layers itself, although such layers should not be laminated but applied together with a water based solvent.

[0011] In a preferred embodiment, the embossed layer is formed from a lacquer applied to a thermoplastic film, the thermoplastic film being preferably a poly-ethylene-terephthalate film. In a more preferred embodiment, this thermoplastic film is laminated to another thermoplastic film, such as a polyethylene film for exam-

ple.

[0012] In the most preferred embodiment according to the invention, the embossed layer is an acrylic based lacquer which is deposited on a 12  $\mu\text{m}$  polyester film using toluene, butyl acetate or ketones as an organic solvent. This embossed layer is thereafter covered with an aluminium layer, which is itself covered with the water solvent based primer which is an aqueous based acrylic, as in a preferred embodiment whereby the water solvent based primer comprises acrylic compounds. The primer is therefore forming a barrier to the migration of the organic solvents comprised in the printed ink layer which is applied onto the primer. In this most preferred embodiment, a white ink and colored inks are printed, the white ink having an ethyl-acetate solvent and the coloured inks having an ethanol solvent. Indeed it was found preferable to use different organic solvents for the ink in order to avoid dissolution of a first ink when a second ink is applied. Indeed, in a preferred embodiment, the printing ink layer comprises a coloured ink and a white ink, the coloured ink having ethanol as an organic solvent and the white ink having ethyl-acetate as an organic solvent. A two-components lacquer is then applied onto the printed ink layer to protect the ink. The side of the PET film which is not covered by the embossed layer is then laminated to a 180  $\mu\text{m}$  polyethylene film. A package made from this film laminate comprising an holographic structure according to the invention allows to avoid dissolution of the embossed layer while maintaining the holographic appearance. Further, this package revealed to be suitable for use as a refill pouch for laundry product when made according to the process described in EP626319. Further, this package can be used to contain up to 3 liters of liquid laundry product, filling occurring at normal production speed, without need for an enlarged head space as would be needed in case of a thicker and more rigid film. Another package is foreseen, whereby each side of the film is made from a thermoplastic material. This may be achieved by applying an extra thin layer of polyethylene, such that both sides of the film could be thermo-sealed. Such a package is particularly well suited for granules laundry products packaging.

#### Claims

1. An holographic structure comprising an organic solvent based embossed layer, a metallic layer located onto the embossed layer, and an organic solvent based printing ink layer characterised in that the printing ink layer and the metallic layer are solely separated by a water solvent based primer.
2. A structure as in claim 1, whereby the embossed layer is formed from a lacquer applied to a thermoplastic film.
3. A structure as in claim 2, whereby the thermoplastic

film is a polyester film.

4. A structure as in claim 2, whereby the thermoplastic film is laminated to another thermoplastic film.
5. A structure as in claim 1, whereby the metallic layer is an aluminium layer.
6. A structure as in claim 1, whereby the embossed layer is an acrylic based lacquer.
7. A structure as in claim 1, whereby the printing ink layer comprises a coloured ink and a white ink, the coloured ink having ethanol as an organic solvent and the white ink having ethyl-acetate as an organic solvent.
8. A structure as in claim 1, whereby the water solvent based primer comprises acrylic compounds.
9. A package made from a film laminate comprising an holographic structure as in claim 1.
10. A package as in claim 9, whereby each side of the film is made from a thermoplastic material.

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## EUROPEAN SEARCH REPORT

Application Number  
EP 98 87 0270

DOCUMENTS CONSIDERED TO BE RELEVANT			Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. 6)
Category	Citation of document with indication, where appropriate, of relevant passages			
X	US 5 319 475 A (KAY RALPH ET AL) 7 June 1994 * column 2, line 66 - column 3, line 8 * * column 4, line 6 - line 63 * * column 5, line 37 - column 6, line 8 * * column 7, line 50 - column 8, line 49 * * column 11, line 17 - column 12, line 19 *	1-6, 8-10	B29C59/02 B42D15/10 G03H1/02 B65D33/00 B44F1/02	
X	WO 93 16888 A (DE LA RUE HOLOGRAPHICS LTD) 2 September 1993 * page 3, line 21 - line 33 * * page 7, line 13 - page 8, line 1 * * page 14, line 1 - page 15, line 4 *	1-6, 8		
X	WO 97 34170 A (CHOCK ERNEST) 18 September 1997 * page 1, line 23 - line 29 * * page 3, line 24 - line 31 * * page 6, line 9 - line 29 *	1-6		
X	US 5 267 753 A (CHOCK ERNEST) 7 December 1993 * column 2, line 65 - column 3, line 38 *	1		
A	US 4 999 075 A (COBURN JR JOSEPH W) 12 March 1991 * column 2, line 14 - line 29 * * column 4, line 58 - column 5, line 19 *	1-8	B29C B42D G03H B65D B44F	
The present search report has been drawn up for all claims				
Place of search <b>MUNICH</b>		Date of completion of the search <b>17 May 1999</b>	Examiner <b>Lindner, T</b>	
CATEGORY OF CITED DOCUMENTS			T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons A : member of the same patent family, corresponding document	
X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document				

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**ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.**

EP 98 87 0270

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

17-05-1999

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5319475 A	07-06-1994	AT 144338 T	15-11-1996
		DE 69122755 D	21-11-1996
		DE 69122755 T	06-03-1997
		DK 530267 T	24-03-1997
		EP 0530267 A	10-03-1993
		ES 2096649 T	16-03-1997
		WO 9118377 A	28-11-1991
		GB 2260514 A,B	21-04-1993
		GR 3021854 T	31-03-1997
WO 9316888 A	02-09-1993	CA 2128789 A	02-09-1993
		DE 69315985 D	05-02-1998
		DE 69315985 T	16-04-1998
		EP 0626909 A	07-12-1994
		GB 2278577 A,B	07-12-1994
		JP 7503674 T	20-04-1995
WO 9734170 A	18-09-1997	AU 2174897 A	01-10-1997
		CN 1193299 A	16-09-1998
US 5267753 A	07-12-1993	AU 3932793 A	21-10-1993
		WO 9318924 A	30-09-1993
US 4999075 A	12-03-1991	JP 3027983 A	06-02-1991

EPO FORM P0458

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82